Owner's Manual

Öhlins Front fork FGRT-series Road & Track

- Safety precautions
- Introduction & design
- Setting up your front fork
- Adjustments
- Changing springs
- Technical information
- Inspection and maintenance
- Oil level adjustments

ÖHLINS
ADVANCED SUSPENSION TECHNOLOGY

Öhlins Racing AB - The Story

It was the 1970's, a young man named Kenth Öhlin spent most of his spare time pursuing his favourite sport: motocross. A careful observer, Kenth's attention was continually drawn to one specific detail - motocross bikes had more engine power than their suspension could handle. It was not long before Kenth realised that better performance could be achieved by improved wheel suspension.

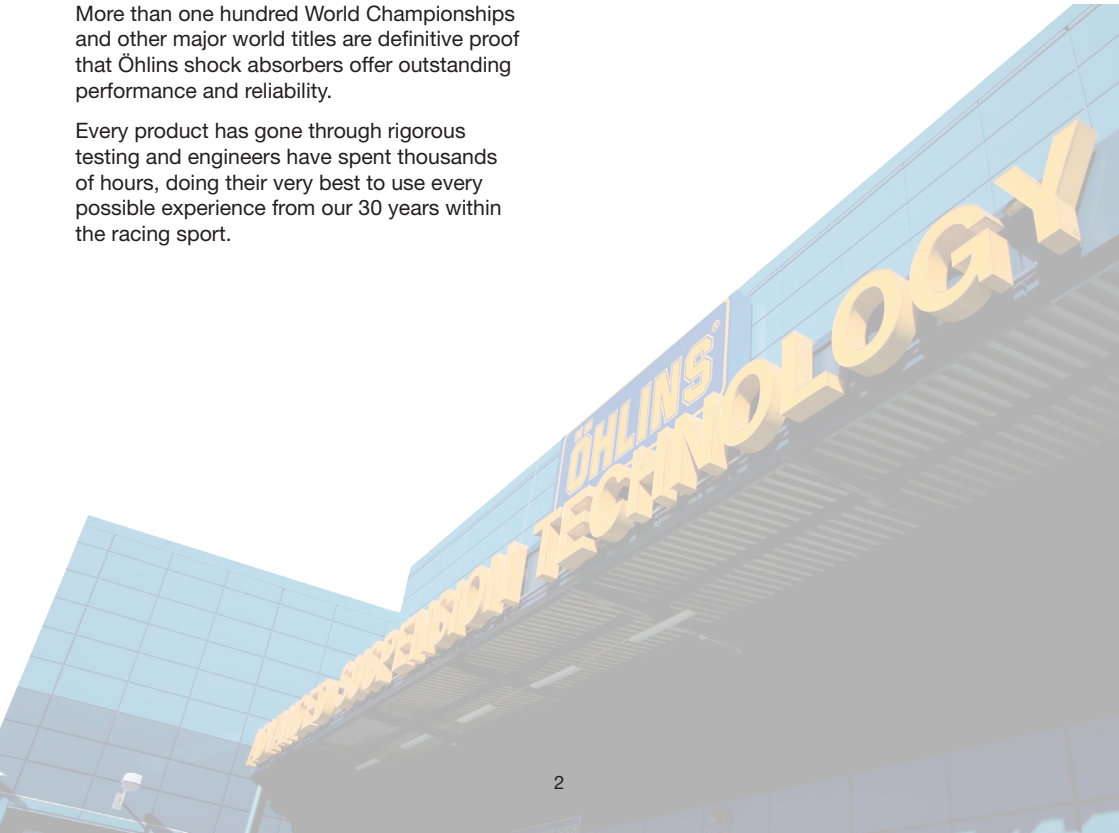
Öhlins Racing was established in 1976, and just two years later the company won its first World Championship title. Despite being in the business for 30 years, the search for perfection and new functions are still the main focus of the company.

You are now the owner of an Öhlins front fork. More than one hundred World Championships and other major world titles are definitive proof that Öhlins shock absorbers offer outstanding performance and reliability.

Every product has gone through rigorous testing and engineers have spent thousands of hours, doing their very best to use every possible experience from our 30 years within the racing sport.

The product that you now have in your possession is pure racing breed that is built to withstand. By installing an Öhlins front fork on your vehicle you have made a clear statement… you are a serious rider with a focus on getting the maximal handling ability and outstanding feedback from your vehicle. Along comes the fact that your front fork will be a long lasting friend, delivering the very best of comfort and performance every time you go for a ride.

Go explore!



Safety precautions

Safety signals

Important information concerning safety is distinguished in this manual by following notations:

⚠

This Safety alert symbol means: Caution! Your safety is involved.

⚠ WARNING!

Failure to follow warning instructions could result in severe or fatal injury to anyone working with, inspecting or using the suspension, or to bystanders.

CAUTION!

Caution indicates that special precautions must be taken to avoid damage to the suspension.

NOTE!

This indicates information that is of importance with regard to procedures.

Before Installation

Öhlins Racing AB can not be held responsible for any damage to the Front Fork or vehicle, or injury to persons if the instructions for installing and maintenance are not followed exactly. Similar, the warranty will become null and void if the instructions are not adhered to.

⚠ WARNING!

1. Installing a suspension, that is not approved by the vehicle manufacturer, may affect the stability of your vehicle. Öhlins Racing AB cannot be held responsible for any personal injury or damage whatsoever that may occur after fitting the suspension. Contact an Öhlins dealer for advice.

2. Please study and make certain that you fully understand the contents in the mounting instruction(s) and the owner´s manual(s) before handling this suspension kit. If you have any questions regarding installation procedures, contact an Öhlins dealer.

3. The vehicle service manual must be referred to when installing the Öhlins suspension.

CAUTION!

Öhlins products are subject to continual improvement and development. Consequently, although these instructions include the most up-to-date information available at the time of printing, there may be minor differences between your suspension and this manual. Please consult your Öhlins dealer if you have any questions with regard to the contents of the manual.

NOTE!

During storage and transportation, especially at high ambient temperature, the oil and grease used for assembling may run out inside the packing and damage the expanded polystyrene packing material. This is not unusual and is in no way detrimental to the suspension.

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Introduction and Design

Introduction

The product in your hand is an artwork, prepared by our dedicated craftsmen at our Swedish facility in Upplands Väsby, Sweden. Its predecessors have battled their way on numerous race tracks in MotoGP and World Superbike and the legacy continues in your front fork. Thousands of hours have been spent together with some of the best teams in the world to find the optimal design and functionality to give you as much performance and comfort as possible. You will feel the difference… be sure.

Design

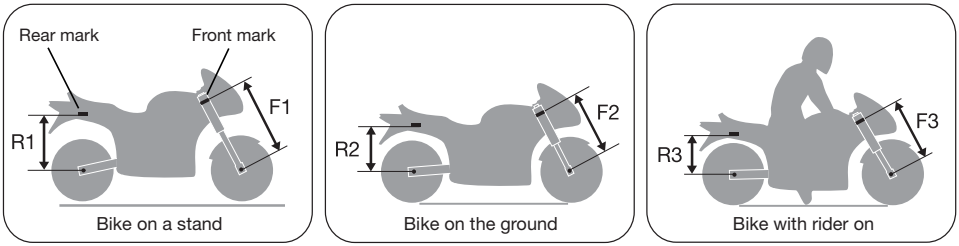
The DNA of this front fork originates in the most prestigious race series in the world and the front fork is weight optimized as a result of that fact. We have used exclusive racing components from our R&D department to increase the performance of the front fork and a lot of work has been done concerning friction reduction.

Our engineers that work on a daily basis with the top riders in the world often hear the word “feeling” and “control” when they debrief after tests and races. We wanted to pour as much of these important factors into your front fork and as a result, the new rigid design with new fork bottoms, outer and inner tubes gives you an unparalleled feedback when riding. For all of you that have your mind set on doing some serious racing we have some really good news. The new front fork is easy to rebuild into a 130 mm stroke which we recommend if you want to go for the No. 1 spot.

We have of course optimized the design so that you can easily have it maintained in a proper way and every single front fork is individually tested with an optimal setting, spring and top-out spring. The new top-cap design will send a signal to all curious spectators when you pull over next to your favourite café or local race track… it’s a signal that says that the owner of the bike has made his choice to go straight for the podium.

We now raise the Road & Track front fork to a new level.

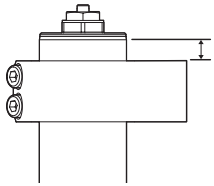
Setting up your front fork



Basic guidelines

This chapter contains some basic guidelines for setting up your Öhlins front fork. Remember though that the front fork is just one part of your motorcycle and to get it to work properly, the whole motorcycle has to be set up in conformance with its manual.

Fork leg extension



Before removing the standard front fork, measure the distance the fork leg is extended above the upper fork crown (see figure). To obtain a correct ride height with the Öhlins front fork, install the Öhlins fork legs at the same position as the standard fork.

Replacing the spring

The spring installed in your Öhlins front fork is chosen after evaluations performed on a test track according to motorcycle characteristics for your specific motorcycle model. Due to variations in ride style, track conditions, body shape etc. the spring is often a subject for additional fine-tuning. Springs are available in 0.5 N/mm intervals from 8 N/mm to 11 N/mm but the rate can be set to 0,25 N/mm increments by using two different rates. A method used on the race track.

Example:
Using 9,5 N/mm in the right fork leg and 10,0 N in the left fork leg gives an average spring rate of 9,75 N/mm.

Set the spring preload

The spring preload is very important since it affects the height of the motorcycle and the fork angle. Consequently, handling characteristics can be changed, even negatively with an incorrect adjustment. Before setting the preload, the sag shall be measured according to procedures below:

- Lift up rear end so that the shock absorber is fully extended
- Measure the distance from the wheel axle to a point marked with i.e. a piece of tape, immediately above the rear wheel (R1)
- Lift up the front of the motorcycle so that the front fork is fully extended
- Measure the distance i.e. between the scraper and the fork bottom (F1)
- Make similar measurements with the motorcycle in upright position, without rider (R2+F2)
- Make similar measurements with the motorcycle in an upright position, with rider (R3+F3). It is of great importance that the rider has a correct riding posture and correct riding gear so that the weight is balanced on the suspension same way as when riding.

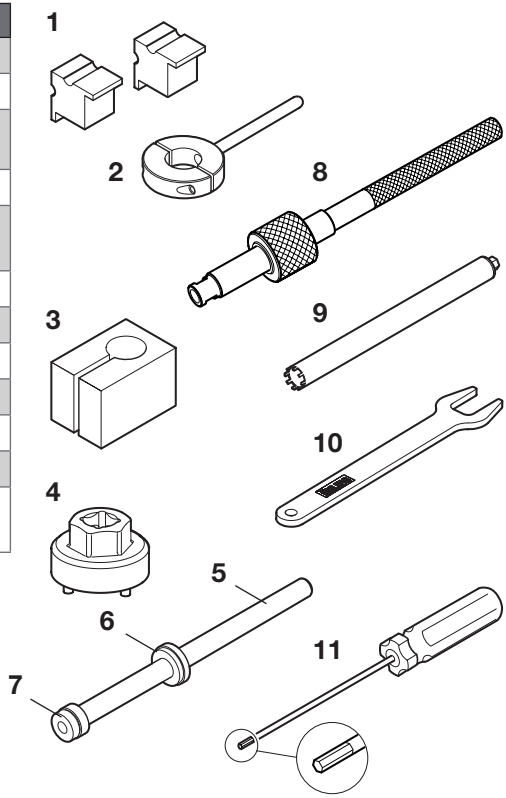
The measurements should be within the following intervals:

Without rider (Free sag):
Rear: 10-20mm (R1-R2)
Front: 15-30mm (F1-F2)

With rider (Ride height):
Rear: 25-40mm (R1-R3)
Front: 35-50mm (F1-F3)

Setting up your front fork - tools

Pos.	Art. No	Description	Remarks
1	00727-02	Soft jaws	ø 12
2	00786-05	Soft jaws	ø 43
3	00787-03	Cylinder tube holder	ø 29,1
4	00797-08	Pin sleeve socket	
5	01757-01	Attachment bar front fork bushing	
6	01758-04	Bar guide	
7	01759-07	Bushing tool	Dismantle
	01759-08	Bushing tool	Installation
8	01765-05	Pull-up tool	
9	01797-07	Seal head tool	
10	04705-03	Spanner, top cap	
11	00794-01	Hexagon screw-driver	



Extended stroke

The FGRT-series of front forks are delivered with a 120 mm stroke but designed with a possibility to be extended up to 10 mm achieving a 130 mm stroke. A 120 mm stroke suits the regular driver well, but often when running a >1000 cc on the race track a 130 mm stroke is desired.

NOTE:

When increasing the stroke, the overall length of the front fork increases by up to10 mm. In order to obtain a correct ride height the fork might need to be raised in the fork crowns. It is of great importance that the clearance between front wheel or fender and i.e. radiator or cowlings is examined along the entire stroke. The easiest way to check the free travel is to open both top caps and compress the fork completely while sweeping the handle bar from side to side.

The basic steps for changing the stroke:

- Adjust the configuration of the spacers below the seal head.
- Replace the preload tube.

The procedure is as follows (the front fork can still be installed on the motorcycle while changing the overall length, but removing it will make the modification a little easier):

1. If the fork is installed on the motorcycle, loosen the upper fork crown.

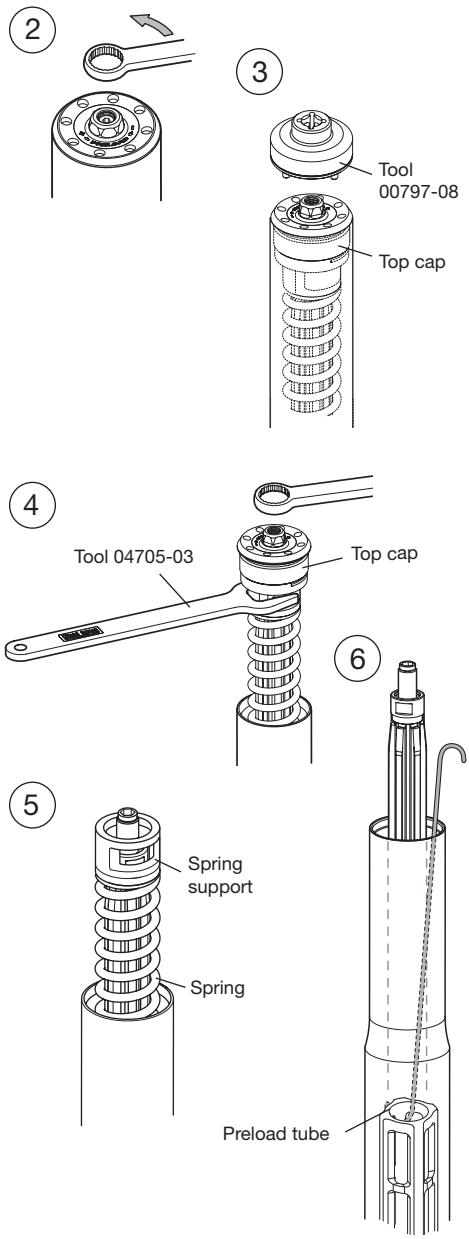
2. Release the spring preload fully (counter clockwise).

3. Open the top cap using tool 00797-08.

4. Use tool 04705-03 to get a grip of the lock nut and remove the top cap. Carefully remove tool 04705-03.

5. Remove the spring support and the spring.

6. Use a wire with a hook to pull out the preload tube.



Setting up your front fork

7. Loosen and remove the shaft assembly using tool 01797-07. Make sure the 0,30 mm shim attached to the base plug follows.

8. On the shaft assembly, remove the top cap lock nut, guide sleeve, spacers (if any) and bump rubber.

9. Remove the base plug from the cylinder tube.

10. Push the shaft gently through the seal head.The shaft with the piston, top-out spring and spacers, is now exposed and ready for modification.

11. Install spacers on the shaft according to the specification card (*spacers @ seal head*).

12. Install the o-ring next to the spacers and push the shaft back through the cylinder tube and seal head.

13. Install the bump rubber, spacers according to specification card (*spacers @ bump rubber*), guide sleeve and top cap lock nut. Wind the lock nut all the way down on the shaft or until 25 mm of the thread (or more) is visible above the nut.

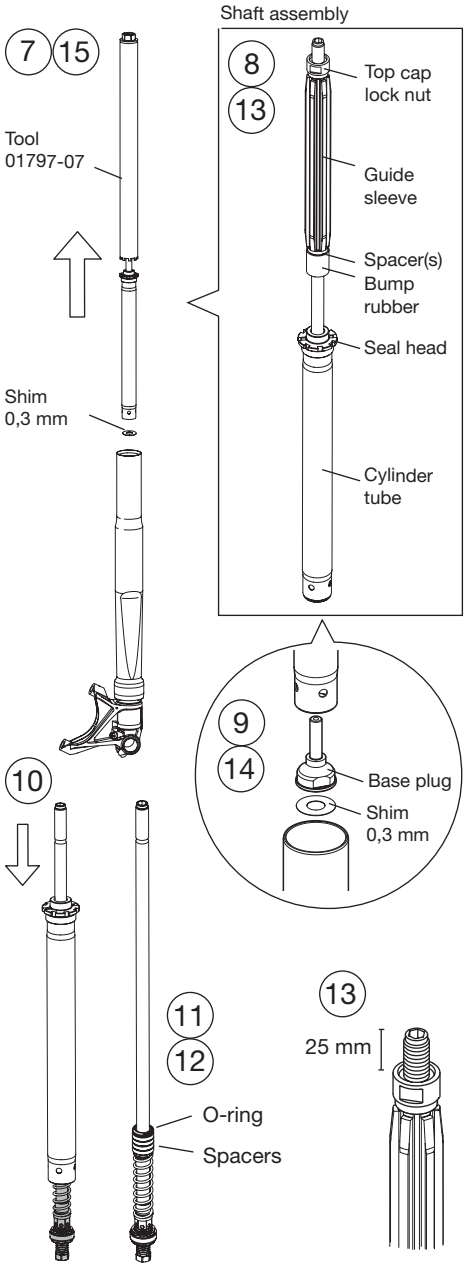
14. Install the base plug into the cylinder tube and attach the 0,30 shim to the base plug using red grease.

15. Install the shaft assembly into the fork leg using tool 01797-07. Tightening torque 20 Nm.

16. Adjust the oil level according to the specification card, procedure see chapter **Oil level adjustments**.

NOTE!

Make sure that the outer tube is slided all the way down before adjusting the oil level.



Setting up your front fork

17. Install the new preload tube (see specification card for correct art. No).

18. Install the spring, with the marking facing up, and the spring support.

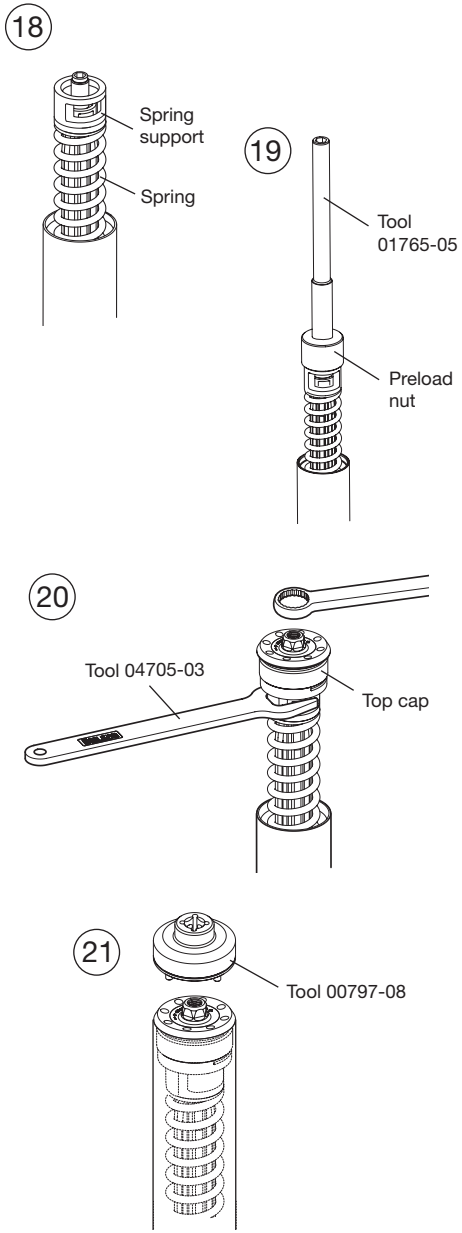
19. Install tool 01765-05 on the shaft and wind the preload nut to contract the springs.

20. Use tool 04705-03 to maintain the contraction and replace tool 01765-05 with the top cap. Make sure the shaft bottoms in the top cap before tightening the lock nut. Tightening torque 20Nm.

21. Install the top cap into the outer fork leg using tool 00797-08. Use red grease on the thread and o-ring and tighten with 10 Nm. Make sure the fork leg is fully extended when tightening the top cap.

22. If the front fork is installed on the motorcycle, tighten the upper fork crown. Tightening torque 20Nm.

23. Set the spring preload according to chapter **Setting up your front fork**.



Adjustments

Adjusters

Your Öhlins front fork is equipped with the following adjusters:

- Spring preload adjuster
- Rebound damping adjuster
- Compression damping adjuster

Spring preload adjustment

Use a 14 mm wrench to turn the upper adjustment screw. Maximum adjustment range is 10 mm. One turn of the adjustment screw will cause 1 mm change in spring preload. The spring has a minimum spring preload of 2 mm, giving an adjustment range of 2-12 mm. Adjust according to the procedure in chapter Set-up.

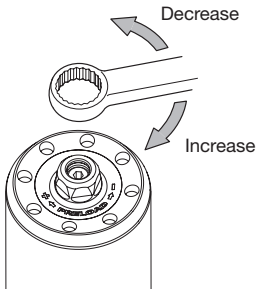
Rebound adjustment

Adjust the rebound damping on the adjustment screw positioned at the top centre of the fork leg. Use a 3 mm allen key. Adjustment range from fully closed valve (clockwise) to maximum open valve (counter-clockwise) is 20 “clicks”. Recommended “clicks” from closed position according to your mounting instruction for your motorcycle model.

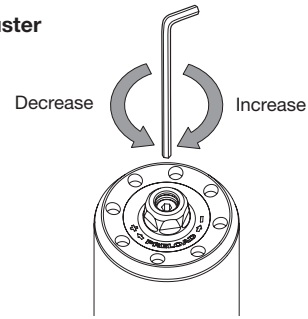
Compression adjustment

Adjust the compression damping on the fork bottom (compression valve). Use a 3 mm allen key. Adjustment range from fully closed valve (clockwise) to maximum open valve (counter-clockwise) is 25 “clicks”. Recommended “clicks” from closed position according to your mounting instruction for your motorcycle model.

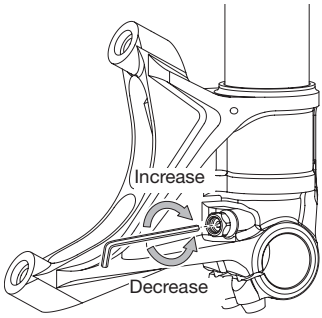
Spring preload adjuster



Rebound adjuster



Compression adjuster



Changing springs

The springs can easily be changed/ replaced with the front fork installed on the motorcycle. Follow this instruction to change the spring.

1. Loosen the upper fork crown.

2. Release the spring preload fully (counter clockwise).

3. Loosen the top cap assembly from the outer fork leg, using tool 00797-08. Carefully slide the outer fork leg down completely.

4. Remove the top cap assembly from the shaft, using tool 04705-03.

5. Remove the tool, the spring support and finally the spring.

6. Screw the top cap lock nut all the way down on the shaft. (Approximately 25 mm free thread above the lock nut).

NOTE!

We recommend you to check the oil level since the removal of a spring often affects the oil level. The oil level is measured without spring or preload tube according to chapter "Oil level adjustments".

7. Replace the spring with the marking facing up.

8. Put the spring support on top of the spring.

9. Use tool 01765-05 to grab the shaft and pull it up.

10. Contract the top-out spring and the main spring using tool 01765-05. Maintain the contraction by placing tool 04705-05 between the spring support and the lock nut.

11. Replace tool 01765-05 with the top cap.

NOTE!

Make sure the shaft bottoms in the top cap assembly before tightening the lock nut.

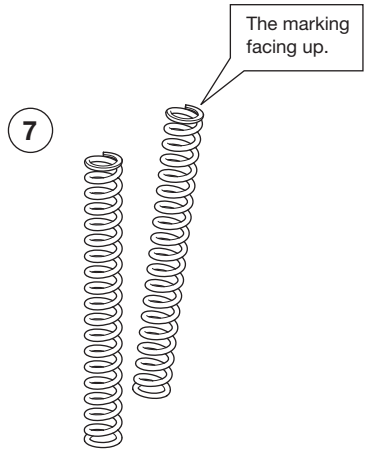
12. Tighten the lock nut with tightening torque 20 Nm.

13. Apply some red grease on the top cap thread and the o-ring.

14. Make sure the fork leg is fully extended when tightening the top cap. Tightening torque 10 Nm.

15. Tighten the upper triple clamp. Tightening torque 20 Nm.

16. Set the spring preload according to chapter **Setting up your front fork**.



Technical information

Fork length

Please see the specification card for your specific front fork.

Stroke

120 mm with possibility to lenghten to 130 mm.

Free spring length

260 mm.

Rebound adjustment

Maximum open valve 20 “clicks”.

Compression adjustment

Maximum open valve 25 “clicks”.

Spring preload adjustment

2-12 mm (0-10 turns).

Spring rate

Please see the specification card for your specific front fork.

Optional springs:

04744-80	8.0 N/mm
04744-85	8.5 N/mm
04744-90	9.0 N/mm
04744-95	9.5 N/mm
04744-10	10.0 N/mm
04744-05	10.5 N/mm
04744-11	11.0 N/mm

Oil Level

Please see the specification card for your specific front fork.

CAUTION!

Use only Öhlins high performance front fork fluid (01309-01).

Loctite

2701 - Fork bottom thread, seal head, piston holder, top cap main nut.

243 - Piston nut.

648 - Upper bushing.

Tightening torque

Upper triple clamp 20 Nm
Lower triple clamp 10 Nm

Grease

Öhlins front fork grease 00146-01 (red grease).

Other available documents regarding your Öhlins front fork - see Öhlins Mounting instruction, Work shop manual, Spare part list and Specification card.

Inspection and maintenance

Clean the front fork externally with a soft detergent. Use compressed air. Be careful that all dirt and debris is removed. Keep the front fork clean and always spray it with oil (QS 14, WD40 or CRC 5-56 or similar) after washing the vehicle.

CAUTION!

Never use strong detergents that can damage the surfaces of the front fork. Use of thinner and brake cleaner will dry out seals, increase the risk of friction, oil leakage or even malfunction.

NOTE!

Make certain that your front fork is always filled with Öhlins High Performance Front Fork Oil (01309-01).

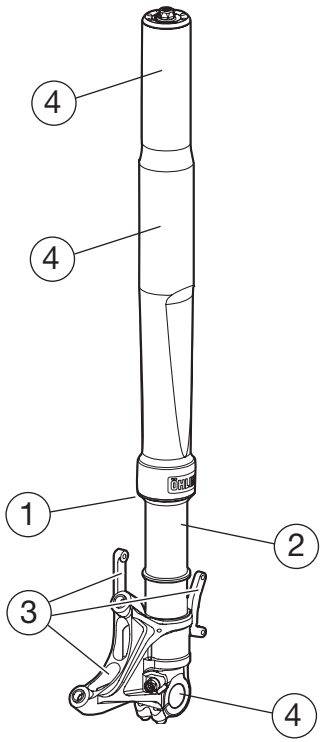
Inspection points (see figure):

1. Check the front fork for external oil leakage.
2. Check the inner fork leg for scratches, dents or other defects (that might harm the seal/bushing).
3. Check fastening of fender brackets and brake caliper.
4. Check fastening to the vehicle.

Preventive maintenance and regular inspection reduces the risk of functional disturbance. If there is any need for additional service, please get in touch with an authorised Öhlins service workshop. There they have the necessary tools and knowhow for whatever you need.

Recommended inspection and maintenance intervals:

Normal use	Once a year or every 5000 km
Race track	Every ten hours



Once every 2nd year (or 20 000 km):

Change front fork oil, use Öhlins front fork oil (1309-01) only.

Remove outer fork leg and inspect the bushings, seals and the full length of the inner fork leg. Replace the seals and bushings if necessary. Proceed according to Öhlins Work shop manual.

NOTE!

Discarded Öhlins products should be handled by an authorized work shop or distributor for proper disposal.

Oil level adjustments

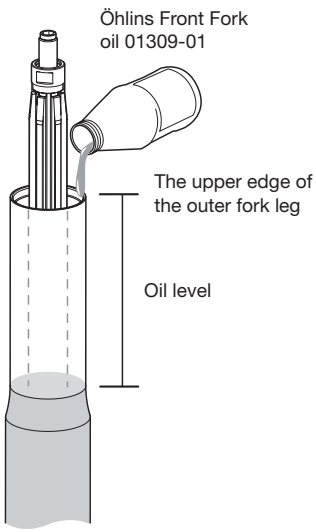
Compared to conventional type of front forks, the upside down front forks are very sensitive to variations in oil level. Therefore, adjust the oil level with special care. A change in the fork oil level will not affect damping force in the early stage of fork travel, but will have a great effect in the later stage.

When the oil level is raised:
The air spring in the later half stage of travel is stronger, and thus the front fork harder.

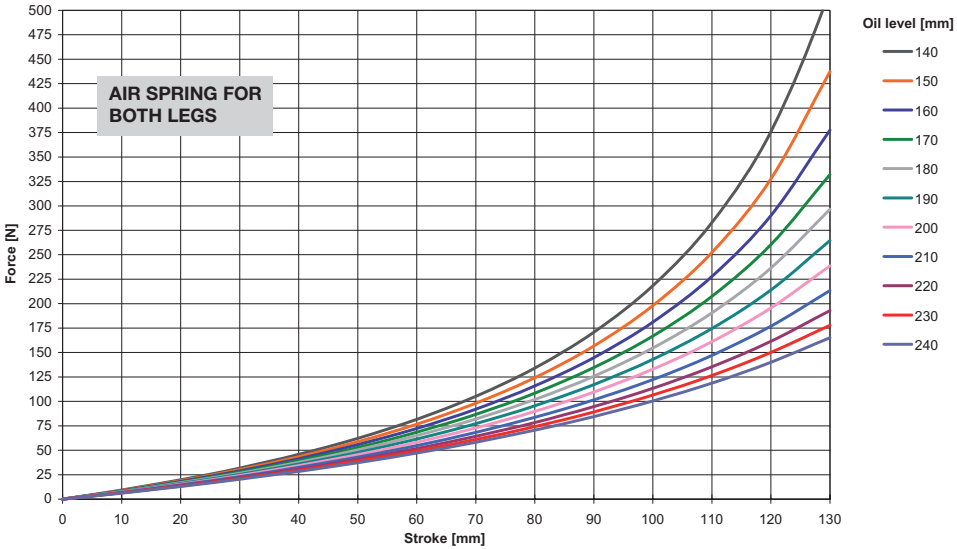
When the oil level is lowered:
The air spring in the later half stage of travel is lessened, and thus the front fork is softer.

Oil level diagram

Adjust the oil level in mm according to the diagram here beside, with the spring and the preload tube removed. For the recommended oil level, see the specification card or mounting instruction for your specific front fork.



Oil level adjustments



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Öhlins Racing AB Box 722
S 194 27 Upplands Väsby Sweden
Phone +46 8 590 025 00
Fax +46 8 590 025 80

CERTIFIERAT ISO 9001 SEMKO CERTIFICATION

CERTIFIERAT ISO 14001 SEMKO CERTIFICATION

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